additional independent claims.

Claims 1, 10 and 11 were objected to. The issue in each case appears to be keeping the terminology for the light emitting device array chips consistent. Each of these claims has been amended to address and overcome this objection.

Claim 3 was rejected as being indefinite under 35 U.S.C. 112, second paragraph. This rejection should now be withdrawn. Specifically, the claim has been amended to recite "said support member" as suggested by the Examiner. Furthermore, additional clarifications to comply with 35 U.S.C. 112, second paragraph have been entered.

Claims 8 and 9 were rejected as being indefinite under 35 U.S.C. 112, second paragraph. It appears that the principle issue raised by the Examiner results from these method claims referring to the subject matter of an apparatus claim. In response, each claim has been revised into independent form using method claim language requiring various steps to be performed, and incorporating the text from the base dependent claim. The claims should now satisfy the requirements of 35 U.S.C. 112, second paragraph.

Amendments have also been made to claims 5, 6, 11 and 15 to provide antecedent basis for recited elements and to use consistent claim terminology.

Claims 30 and 31 have been amended to depend from claim 18. As such, the objection under 37 C.F.R. 1.75 should now be withdrawn.

Claims 1, 2, 6, 9-11 and 15-18 were rejected as being anticipated by European Patent 0 790 132 A2 to Tsukagoshi et al. This rejection is respectfully traversed.

The invention describes an optical write head configuration which simplifies manufacturing processes, and particularly processes pertaining to the alignment and distance between and LED array and a rod lens array. Figure 1 and Figure 5 show different embodiments of the invention. At its core, a rod lens array (e.g. 111 in Figure 1 and 254 in Figure 5), a substrate support member (e.g., 136 in Figure 1 and 251 in Figure 5) on which a substrate (e.g., 130 in Figure 1 and 257 in Figure 5) that supports an LED (e.g., 132 in Figure 1 and 250 in Figure 5), and a driver circuit board (e.g., 134 in Figure 1 and 255 in Figure 5) are all secured directly to the same support member (e.g, 140 in Figure 1 and 256 in Figure 5). As explained in detail throughout the specification, alignment is

simplified by a number of different strategies.

For example, the rod lens array can be secured by drilling openings through the common support member and injecting adhesive therein (as is the subject matter of claim 4, for example, and is best shown in Figure 3). A V-shaped groove 144 shown in Figure 3 allows adhesive to be distributed along the back of the rod lens array. Because of the adhesive injection hole configuration, the rod lens array is held at a precise location and the tolerance is not adversely affected as would be the case if adhesive was present between the rod lens array and the support member.

As another example, the substrate support member is firmly affixed to the support member by a bolt or other suitable device. Alignment of the LED with the rod lens array (i.e., the precision of distance Y) an be achieved by using a precision machine reference plane B on the substrate support member which abuts the reference plane A of the support member (see page 24 of the application). Thus, the precision only depends on the precision of the die bonder.

As yet another example, the distance LO (see Figure 1) between the LED and the rod lens array is adjustable by using a bolt 150 that passes through a hole 138 in the substrate support member which is wider in diameter than the bolt. By loosening the bolt, eccentric pins (see 158 in Figure 2) can be used to move the substrate support member 136 up and down relative to the rod lens array, and, once aligned, the bolt can be fastened tight.

Similar strategies are used in the Figure 5 embodiment. The Figure 5 embodiment provides the additional feature where a flexible printed circuit board (257) is used to connect the LEDs 250 to the driver circuit 255.

Careful review of the Tsukagoshi reference will reveal that none of the strategies noted above is shown or suggested therein. That is, Tsukagoshi does not provide any configuration which addresses the alignment issues solved by the present invention in the same or a similar way.

Claim 1 has been amended to make clear that each of the rod lens array, the substrate support member for supporting the substrate, and a driver circuit board are secured directly to a support member. The Examiner references the U-shaped member 82 shown in Figure 22 of Tsukagoshi as being a support member which holds each of these element. This is not correct. With reference to column

10, lines 36 et seq. of Tsukagoshi, 82 is a metal base, and the support members are 83 and 84. The rod lens array 10 and driver circuit board 4 are not secured directly to a common support in Tsukagoshi. Further, if 1 is the substrate in Tsukagoshi, it is not secured directly to a common support with the rod lens array, and the LEDs 2 are not positioned on the substrate.

Claim 10 is an independent claim, and requires that the light emitting device array chips are mounted directly on a flexible printed circuit sheet. A suitable configuration is shown in Figure 5 of the application. Tsukagoshi, by contrast, does not show any flexible printed circuit sheet. Figure 22, referenced by the Examiner, shows the LED chips 2 mounted on the IC driver 4. The Examiner also references Figure 1 of Tsukagoshi of showing the flexible printed circuit sheet; however, Figure 1 shows a circuit board, not a flexible printed circuit sheet, and, due to its flat configuration, there would be no motivation to substitute a flexible printed circuit sheet. Contrasting Figure 1 of Tsukagoshi with Figure 5 of the present application, it can be seen that the flexible printed circuit sheet 257 allows for miniaturization to be realized since the sheet 257 can bend around the support member.

Claims 17 and 18 are directed to optical write heads, which, like claim 10, require a flexible printed circuit board. Claim 17 requires the coefficient of thermal expansion of the member to which the flexible printed circuit board is in contact to match the rod lens array. Claim 18 requires the coefficient of thermal expansion of the member to which the flexible printed circuit board is in contact to match the LED chips. Both of these requirements prevent misalignment from occurring during fabrication or other operations. As noted above, Tsukagoshi does not show or contemplate the flexible printed circuit board in the combination of elements. Moreover, Tsukagoshi does not contemplate the existence of a "member" (i.e., a rigid metallic member) that is in contact with the flexible printed circuit board which has certain thermal expansion characteristics designed to prevent misalignment. The Examiner's reference to U-shaped base 35 (shown in Figure 10) as being the rigid member, is not on point. Note that the circuit board in Figure 10 is NOT connected to the base 35.

Claim 16 is an independent method claim and also requires the flexible printed circuit sheet that is not shown or contemplated by Tsukagoshi. The

method claim requires bonding the LED array chips directly to the flexible printed circuit sheet. As noted above, this is not shown or suggested in Tsukagoshi. The method claim requires bonding the flexible printed circuit sheet to a member having rigidity. As noted above, Tsukagoshi shows no such element.

All claims which depend from the independent claims discussed in detail above, would be patentable over Tsukagoshi for the same reasons as the base independent claims.

Claims 3, 14, and 19-29 have been rejected as being obvious over Tsukagoshi in view of Kusuda. This rejection is respectfully traversed.

Kusuda does not provide and or make obvious any of the elements lacking in the Tsukagoshi reference; therefore, no combination of the two references would make the claimed invention obvious. Specifically, Kusuda does not show the flexible printed circuit sheet in the combination and does not show each of the rod lens array, the substrate support member for supporting the substrate, and a driver circuit board are secured directly to a support member. Indeed, Kusuda does not show or suggest any of the alignment strategies for an optical device that are described in the present application. Any modification of Kusuda and Tsukagoshi or combination thereof would an impermissible hindsight reconstruction which, even if made, would not provide the attributes of the present invention or include the various features required in the claims.

Of this group of claims referenced by the Examiner, claim 21 is an independent claims not previously discussed. However, claim 21 requires the flexible printed circuit substrate fixed to the support member discussed in detail above. This feature is wholly lacking in each of Tsukagoshi and Kusuda.

Claims 12 and 13 were rejected as being obvious over a combination of Tsukagoshi and U.S. Patent 5,607,048 to Kaizu. This rejection is traversed.

Claims 12 and 13 depend from claim 10 and require a flesible printed circuit sheet. Claim 12 requires a resin layer and a copper foil and no adhesive being interposed between the resin and copper foil. Claim 13 requires a specific thickness range for the flexible printed circuit sheet.

At the outset, the Examiner should recognize Kaizu is directed to a completely different technology than Tsukagoshi. Specifically, Kaizu describes a light illumination membrane (for example, a touch panel for numeric pad). In

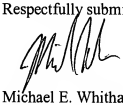
Kaizu, the LED is not aligned with any sort of lens. Rather, the LED 26 shines through the membrane (IT IS NOT ALIGNED WITH A ROD LENS ARRAY). Because both references have essentially nothing to do with each other, any combination of the two appears improper. Moreover, there would be no motivation to use the flexible printed circuit board of Kaizu in Tsukagoshi. As noted above, in Figure 1 of Tsukagoshi, the substrate which supports the LEDs is flat.

In view of the foregoing, it is respectfully requested that the application be reconsidered, that claims 1-31 be allowed, and that the application be passed to issue.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

A provisional petition is hereby made for any extension of time necessary for the continued pendency during the life of this application. Please charge any fees for such provisional petition and any deficiencies in fees and credit any overpayment of fees for the petition or for entry of this amendment to Attorney's Deposit Account No. 50-2041 (Whitham, Curtis & Christofferson P.C.).

Respectfully submitted,



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